Sectional Names in *Carex* (Cyperaceae) for the Flora of North America

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ABSTRACT. Review of the sectional nomenclature for the treatment of *Carex* for the *Flora of North America* disclosed a number of deficiencies in the currently accepted sectional names. Three sectional names needed typification, including *Carex* sect. *Firmiculmes*, lectotypified with *C. geyeri*, *Carex* sect. *Inflatae*, lectotypified with *C. breweri*, and *Carex* sect. *Leptocephalae*, lectotypified with *C. leptalea*. Several earlier names than those in use in recent monographs were also discovered, including *Carex* sect. *Racemosae* for *Carex* sect. *Microrhynchae* (*Carex* sect. *Atratae*), *Carex* sect. *Thuringiaca* for *Carex* sect. *Glaucae*, and *Carex* sect. *Dornera* for *Carex* sect. *Callistachys*. Two sectional names in common use, *Carex* sect. *Hispidae*, sect. nov., and *Carex* sect. *Longicaules*, sect. nov., were not published with Latin descriptions nor reference to previously published descriptions and are here validly published and precisely circumscribed. Finally, two new sections are proposed to accommodate North American species that did not fit adequately into existing sections. These are *Carex* sect. *Glaucesentes*, sect. nov., for four species of large, glaucous clump-forming wetland sedges with papillose perigynia and *Carex* sect. *Hirtifoliae*, sect. nov., a monotypic section for *C. hirtifolia*, a distinctive, pubescent-leaved forest understory species with long-beaked perigynia with nerveless faces.

Key words: *Carex*, Cyperaceae, North America, sections.

Sectional nomenclature is one of the more thankless aspects of writing floras and monographs. Section names can be quite useful for understanding large genera and especially as a learning aid. They are commonly used in *Carex* L., so having stable sectional names is important. Use of formal sectional names by early authors was quite erratic, and there are no modern indices to sectional names. Finding the oldest names and achieving stability is thus a difficult task.

Mackenzie's (1931, 1935) monumental monograph is the base for work on North American *Carex*. However, there are many changes needed for sectional names. Mackenzie, like most of his contemporaries, was not fastidious about making sure that his sectional names were validly published at the rank of section. Furthermore, he was eccentric in only utilizing sectional names based on specific epithets, which considerably distorted his sectional nomenclature. Fortunately, Egorova (1999) did caricologists worldwide a tremendous and much appreciated service by producing a modern synthesis of sectional nomenclature and thoroughly typifying sectional names in her *Carex* monograph for the former Soviet Union. Many of these sections also occur in North America, but there are a number of sections in the North American flora that are not present in Eurasia. Sectional names for some of these need lectotypification so that all sectional names used in the *Flora of North America* can be properly typified. In a few cases, earlier names than ones used by Egorova have also been found. All these are documented here. One of the major sources of earlier sectional names in *Carex* is Don (1830), as noted by Tucker (1987). Heuffel (1858) [1859] also contained validly published sectional names. Some sectional names used by L. H. Bailey in his "A preliminary synopsis of North American *Carex*" (Bailey, 1886) were actually first published in slightly earlier works to which Bailey contributed, such as Coulter's *Manual of the Botany of the Rocky Mountain Region* (Bailey, 1885) and thus predate Christ's (1885 [14 Jan. 1886]) *Nouveau Catalogue des Carex d'Europe*, another major source of names at sectional rank for sections occurring also in Europe.

Mackenzie (1935) published a few sectional names posthumously without a Latin description. Although these have been in common use, they need validation, and this is also done here. Finally, some primarily North American species or groups of species that have up to now been subsumed into Old World sections or into very broadly defined sections are here acknowledged to be distinctive and are also given sectional names.

SECTIONAL NAMES NEEDING LECTOTYPIFICATION

Carex sect. **Firmiculmes** (Kükenthal) Mackenzie, N. Amer. Flora 18: 221. 1935. *Carex* subsect.

Firmiculmes Kükenthal, in A. Engler, Pflanzenr., 20[IV, 38]: 96. 1909. LECTOTYPE (here designated): *Carex geyeri* Boott, Trans. Linn. Soc. London 20(1): 118. 1846.

Kükenthal (1909) included *Carex geyeri, C. multicaulis* L. H. Bailey, and *C. phyllostachys* C. A. Meyer in his subsection *Firmiculmes.* Mackenzie (1935) included only *C. geyeri* and *C. multicaulis* when he raised the subsection to sectional rank, explicitly excluded the Eurasian *C. phyllostachys,* and indicated that it was composed of "two dry ground species, in the western part of the United States, extending into southwestern Canada." Both *C. geyeri* and *C. multicaulis* fit Kükenthal's and Mackenzie's descriptions fully, and *C. geyeri* is the more common and widespread species. More recently, a third species, *C. tompkinsii* Howell (1961), was described as a very localized California endemic closely related to *C. multicaulis.*

Carex sect. **Inflatae** Kükenthal, in A. Engler, Pflanzenr., 20[IV, 38]: 96. 1909. LECTOTYPE (here designated): *Carex breweri* Boott, Ill. Carex, part 4.142, t. 455. 1867.

Kükenthal (1909) included two western North American alpine species, *Carex breweri* and *C. engelmannii* L. H. Bailey in this section, as did Mackenzie (1931). Both species are very similar and fit the sectional description fully. *Carex breweri* is the more common species. *Carex subnigricans* Stacey (1939), another western North American alpine, has also been described in this section.

Carex sect. **Leptocephalae** L. H. Bailey, Proc. Amer. Acad. Arts 22: 131. 1886. LECTOTYPE (here designated): *Carex polytrichoides* Muhlenberg ex Willdenow, Sp. Pl. 4: 213. 1805.

Bailey (1886) included four species in his small section *Leptocephalae*: *Carex leptalea* Wahlenberg (as *C. polytrichoides*), *C. microglochin* Wahlenberg (by error, through a misunderstanding of the identity of *C. lyonii* Boott), *C. anthoxanthea* J. Presl & C. Presl (as *C. leiocarpa* C. A. Meyer), and *C. circinata* C. A. Meyer. *Carex anthoxanthea* and *C. circinata* are very similar, and have long been put into section *Circinatae* Meinshausen. Bailey's brief sectional description appears to have been drawn largely from *C. leptalea,* and it is logical to typify his name with this species.

SECTIONAL NAMES PREDATING THOSE USED BY EGOROVA (1999)

Carex sect. **Racemosae** G. Don, in Loudon, Hort. Brit. 376. 1830. LECTOTYPE (here designated): *Carex atrata* L., Sp. Pl. 976. 1753.

The only other species included by Don in this section is *Carex bicolor* Allioni. Both *C. bicolor* and *C. atrata* fit the brief sectional description equally well. Lectotypification with *C. bicolor* would, however, displace the name *Carex* sect. *Bicolores* (Tuckerman ex L. H. Bailey) Rouy, which will be recognized in the *Flora of North America.* As the familiar name *Carex* sect. *Atratae* has already been displaced with the unfamiliar name *Carex* sect. *Microrhynchae* by Egorova (1999), it seems the lesser of two evils to typify *Carex* sect. *Racemosae* with *C. atrata.* Some authors, including Egorova (1999), do, however, place *C. bicolor* in the same section as *C. atrata* and its relatives. The typification proposed here thus has no impact on the name for the broadly conceived section, but allows people who recognize section *Bicolores* to continue to do so under the familiar name.

Egorova (1999) used the later *Carex* sect. *Microrhynchae* (Drejer) L. H. Bailey in Coulter (Man. Bot. Rocky Mt. 379. 1885, Lectotype designated by Egorova: *Carex atrata*) for the name of this section. She dated the section from Bailey (1886), but believed that *Carex* sect. *Atratae* (Heuffel) Christ, Bull. Soc. Roy. Bot. Belgique 24: 15. 14 Jan. 1886 "1885," used throughout North American Cyperaceae literature and also by Chater (1980) in *Flora Europaea,* was a nomen nudum.

Carex sect. **Thuringiaca** G. Don, in Loudon, Hort. Brit. 376. 1830. TYPE: *Carex thuringiaca* Willdenow, Sp. Pl. 4: 250. 1805.

Egorova (1999) used the later name *Carex* sect. *Glaucae* (Ascherson) Rouy (Fl. France 13: 491. 1912. Type: *C. glauca* Scopoli, Fl. Car. Ed. 2, 2: 223. 1772). Both *Carex thuringiaca* and *C. glauca* are long abandoned synonyms of *C. flacca* Scheber, Spic. Fl. Lips.178. 1771. Mackenzie (1931) placed *Carex flacca* in *Carex* sect. *Pendulinae* (Fries) Mackenzie, a much later name.

Carex sect. **Dornera** Heuffel, Verh. Zool. Bot. Ges. Wien 8: 217. 1858. TYPE: *Carex pyrenaica* Wahlenberg, Kongl. Vetensk. Acad. Nya Handl. 24: 139. 1803.

Egorova (1999) used the later name *Carex* sect. *Callistachys* (Heuffel) Mackenzie, N. Amer. Flora 18: 26. 1931, also with *C. pyrenaica* as the type.

MACKENZIE SECTIONAL NAMES NEEDING VALIDATION WITH A LATIN DESCRIPTION

Latin descriptions or diagnoses were required for valid publication of new names starting 1 January 1935. New sectional names in those parts of Mackenzie's monograph published in 1935, however, lack Latin descriptions. Those to be used in the *Flora of North America*, *Carex* "section *Hispidae*" and *Carex* "section *Longicaules*," both in subgenus *Carex*, are here validated.

Mackenzie's (1931, 1935) monograph was published in a number of installments. Parts 1 to 3 (pp. 1–168) were published during 1931, except for pages 11–20. Parts 4 to 7 (pp. 169–478) were published during 1935. Pages 11–20, the conspectus and key to the sections, although included with part one, were published later and have a 1935 date on the running head. Some copies of Mackenzie (1931) have an unnumbered page inserted after page 10 with the note "Pages 11–20, constituting a conspectus of the sections of the genus *Carex* and an artificial key to these sections, will be issued with a later Part of this volume." Therefore, although all sectional names have English descriptions on pages 11–20 of part 1, these are not validly published, as the publication date was 1935, not 1931.

Carex sect. **Hispidae** Mackenzie ex Reznicek, sect. nov. TYPE: *Carex spissa* L. H. Bailey, Proc. Amer. Acad. Arts 22: 70. 1886.

Cespitosae vel coloniales, rhizomatibus crassis, brevis. Culmi 60–200 cm alti; basi vaginis coriaceis, atrofuscis. Folia 3–12, coriacea, glabra, glauca; vaginis reticulatim fissis. Inflorescentiae 20–70 cm longae, erectae; spicis 5–12(–20), ascendentibus, terminalibus staminatis, lateralibus pistillatis, staminatis, vel androgynis; bracteis infimis evaginatis vel brevivaginatis. Squamae pistillatae lanceolatae, coriaceae, conspicue aristatae. Perigynia glabra vel hispidula, ovoidea vel obovoidea, interdum brevirostra. Stigmata 3.

Densely colonial from very thick short rhizomes; basal sheaths leathery, dark brown. Culms apparently lateral central, 60–200 cm. Leaves coriaceous, 3 to 12, V-shaped in cross section, glabrous, glaucous; sheath fronts membranous or coriaceous, prominently nerved and becoming ladder-fibrillose. Inflorescences 20–70 cm long with 5 to 12 (20) spikes, occasionally up to 3 per node, terminal spikes staminate, lateral spikes pistillate or the distal 1 to 5 staminate or sometimes androgynous, sessile or the distal short peduncled, stiffly erect; proximal bracts leaf-like, sheathless or short-sheathing, exceeding the inflorescence. Pistillate scales coriaceous, lanceolate, conspicuously awned. Perigynia ascending to spreading, ovoid to narrowly ovoid to obovoid, ellipsoid to flattened-ellipsoid or ± compressed-trigonous in cross section, faintly nerved, pale brown, reddish brown dotted, glabrous to hispidulous, tapering to the apex or contracted to a short erose or ± entire beak, stigmas 3.

SPECIES INCLUDED:

1. *Carex pringlei* L. H. Bailey, Bot. Gaz. 17: 151. 1892.
2. *Carex spissa* L. H. Bailey, Proc. Amer. Acad. Arts 22(1): 70. 1886.

Mackenzie (1935) recognized this section, but provided only an English description. He included four species, *Carex spissa*, *C. ultra* L. H. Bailey, *C. seatoniana* L. H. Bailey, and *C. pringlei*, in North America (including Mexico) and alluded to several other Asian and European species. More recent authors (Hermann, 1974) recognized only two North American species, *C. pringlei* and *C. spissa*, with three varieties encompassing Mackenzie's other species. Plants of this section are very robust, broad-leaved plants, 60–200 cm tall, of stream banks, wet depressions, and marshes in areas with hot and dry climates.

Kükenthal placed *Carex spissa* and *C. pringlei* in his section *Trachylaenae* (Drejer) L. H. Bailey. The European and Asian species alluded to by Mackenzie as belonging in this section are thus presumably all the other species included by Kükenthal in section *Trachylaenae*, with the exception of *C. flacca*, which Mackenzie placed in his section *Pendulinae* (Fries) Mackenzie. These Eurasian taxa were *C. setigera* D. Don (including *C. schlangintweitiana* Boeckeler), *C. inanis* Kunth, and *C. hispida* Willdenow. Except for *C. hispida*, these species are all very different from *C. spissa* and *C. pringlei*, in being much shorter, with much narrower leaves, narrower spikes, and long-sheathing bracts. They are also high-elevation species of the central and southern Asian mountains, especially the Himalayas. These Eurasian species are explicitly excluded from this section as here conceived. The Mediterranean *Carex hispida*, however, though long-rhizomatous, is similar to *C. spissa* and *C. pringlei* in some features, and may well, with further research, turn out to belong in this section. We can probably assume that Mackenzie (1935) based his "section *Hispidae*" actually on *C. hispida*, rather than on the misapplication of *C. hispida* to *C. spissa* found in some early North American literature, even though *C. hispida* is not explicitly mentioned. But because this section, as circumscribed here, is entirely New World, *C. spissa* is designated as the type.

Carex sect. **Longicaules** Mackenzie ex Reznicek, sect. nov. TYPE: *Carex longicaulis* Boeckeler, Flora 65: 62. 1882.

Dense vel laxe cespitosae, rhizomatibus brevis. Culmi 15–110 cm alti; basi vaginis purpureis vel fuscis. Folia 5–12, glabra, scabra, vel pubescentia. Inflorescentiae 1.1–12 cm longae, erectae; spicis 2–5, erectis, terminalibus staminatis vel gynaecandris, lateralibus pistillatis, sessilibus vel brevipedunculatis; bracteis infimis brevivaginatis vel evaginatis. Squamae pistillatae ovatae, acutae vel cuspidatae. Perigynia glabra vel pubescentia, ovoidea vel obovoidea, in rostrum brevidentatulum contractum. Stigmata 3.

Densely to loosely caespitose from short to slightly elongate rhizomes, basal sheaths reddish purple to brown. Culms central, 15–110 cm. Leaves 5 to 12, glabrous, scabrous, or pubescent; sheath fronts membranous, reddish brown dotted or tinged or stramineous, pubescent, scabrous, or glabrous. Inflorescences 1.1–12 cm long, with 2 to 5 spikes, the terminal staminate or gynaecandrous, the lateral pistillate, sessile or short-peduncled; distal bracts leaf-like, shorter than to exceeding the inflorescence, short-sheathing. Pistillate scales ovate, acute or cuspidate. Perigynia ascending, ovoid or obovoid, trigonous, the faces 3- to 7-nerved, green, glabrous or finely pubescent, tapering to a short, bidentulate beak. Stigmas 3.

SPECIES INCLUDED:

1. *Carex anisostachys* Liebmann, Mexic. Halvgr. 78. 1850.
2. *Carex ciliaris* Fernald, Proc. Amer. Acad. Arts 43: 61. 1907.
3. *Carex coulteri* Boott, in Hemsley, Biol. Cent.-Amer., Bot. 3: 473. 1885.
4. *Carex guatemalensis* F. J. Hermann, Brittonia 23: 145. 1971.
5. *Carex longicaulis* Boeckeler, Flora 65: 62. 1882.
6. *Carex whitneyi* Olney, Proc. Amer. Acad. Arts 7: 394. 1868. ["Whitneyi."]

Mackenzie (1935: 272) recognized this section as "a group of dry-ground species of which five, confined to California and the mountains of Mexico, are known." *Carex* sect. *Longicaulis* refers to a small, apparently uniform group of species of uncertain relationships occurring in dry to mesic forests and forest openings. Mackenzie recognized *Carex flaccifolia* Mackenzie and *C. whitneyi* from California and *C. anisostachys, C. longicaulis*, and *C. coulteri* from Mexico. *Carex flaccifolia* was based on a presumably mislabeled specimen, and has long been placed into the synonymy of *C. whitneyi* (Howell, 1958). Howell (1958) also described *Carex jepsonii*, a segregate of *C. whitneyi*, now also not recognized (Mastrogiuseppe, 1993). Hermann (1974) recognized *Carex guatemalensis* in this section from Guatemala, and Reznicek (1993) resurrected the Mexican *C. ciliaris* at species rank, bringing the number of species in this section to six.

NEW SECTIONS

Two new sections in subgenus *Carex* are here described for distinctive elements of the North American *Carex* flora.

Carex sect. **Glaucescentes** Reznicek, sect. nov. TYPE: *Carex glaucescens* Elliott, Sketch Bot. S. Carolina 2: 553. 1824.

Cespitosae. Culmi 50–150 cm alti, basi vaginis fuscis vel purpureo-fuscis. Folia 5–15, glauca, plus minusve papillata. Inflorescentia 10–40 cm longae, erectae vel arcuatae; spicis 3–8, ascendentibus vel arcuatis, pedunculatis, terminalibus staminatis, lateralibus staminatis, pistillatis, vel androgynis; bracteis infimis evaginatis vel brevivaginatis. Squamae pistillatae acutae vel retusae, aristatae. Perigynia papillata, anguste ovoidea vel late obovoidea, in rostrum contractum. Stigmata 3.

Caespitose in large, leafy clumps, rhizomes short and stout; basal sheaths coriaceous, brown to dull reddish purple. Culms central, 50–150 cm tall. Leaves 5 to 15, M-shaped in cross section, glaucous and ± papillose beneath; sheath fronts brownish hyaline, finely brown-dotted. Inflorescences 10–40 cm, with 3 to 8 spikes, terminal spikes staminate, lateral spikes pistillate or the distal 1 or 2 staminate or androgynous, peduncled, erect or pendent; proximal bracts leaf-like, exceeding the inflorescence, sheathless or short-sheathing. Pistillate scales acute to retuse, awned. Perigynia ascending or spreading, narrowly ovoid to broadly obovoid, rounded-trigonous to flattened-elliptic in cross section, strongly to weakly nerved, papillose, tapering or contracted to a short, entire or weakly bidentulate beak, stigmas 3, anthers 3, reddish.

SPECIES INCLUDED:

1. *Carex brasiliensis* St.-Hilaire, Voy. Distr. Diam. 1: 369. 1833.
2. *Carex glaucescens* Elliott, Sketch Bot. S. Carolina 2: 553. 1824.
3. *Carex joorii* L. H. Bailey, Proc. Amer. Acad. Arts 22(1): 72. 1886.
4. *Carex verrucosa* Muhlenberg, Descr. Gram. 261. 1817.

Carex glaucescens, with its two close allies, *C. joorii* and *C. verrucosa*, form a tightly knit natural group of large, southeastern United States wetland species of acid soils in swamp forests, savannas, wet meadows, boggy depressions, and man-made habitats of similar character, such as ditches and shallow excavations. *Carex brasiliensis*, of wet savannas in temperate South America, appears to belong with these species, as first suggested by Boott (1860), although its affinities need more research.

Until now, these species have been awkwardly, and sometimes arbitrarily, placed in sections consisting of primarily Eurasian species of very dissimilar morphology. Kükenthal (1909) placed *Carex joorii* in his section *Maximae* (Ascherson) Kükenthal, but placed *C. glaucescens* (including *C. verrucosa*) and also *C. brasiliensis* in *Carex* sect. *Paludosae* G. Don. *Carex glaucescens* and its allies differ from all these species in their papillose perigynia and basal staminate flowers of the pistillate spikes, from species in section *Maximae* by their sheathless or short-sheathing bracts, and from almost all species in section *Paludosae* by their caespitose habit. Mackenzie (1935), on the other hand, kept *C. glaucescens*, *C. joorii*, and *C. verrucosa* together but placed them in his section *Pendulinae*, along with the Eurasian *C. flacca*. *Carex flacca* is a very different plant, however, being much smaller, with elongate, creeping rhizomes, scabrous-hispid perigynia, and awnless pistillate scales. *Carex glaucesens* and its allies, in fact, appear to have no close relatives in the *Carex* flora elsewhere in the world.

Carex sect. **Hirtifoliae** Reznicek, sect. nov. TYPE: *Carex hirtifolia* Mackenzie, Bull. Torrey Bot. Club 37: 244. 1910.

Laxe cespitosae vel coloniales, rhizomatibus brevirepentibus. Culmi 25–80 cm alti, arcuati, basi vaginis rubrobrunneis. Folia 3–5, molliter pubescentia, vaginis pubescentibus. Inflorescentiae 2–8 cm longae, erectae, spicis 2–5, ascendentibus, terminalibus staminatis, lateralibus pistillatis, brevipedunculatis; bracteis infimis evaginatis. Squamae pistillatae aristatae. Perigynia pubescentia, ellipsoidea-obovoidea, trigona, 2-nervata, in rostrum bidentatulum 0.7–1.5 mm longum contractum. Stigmata 3.

Loosely caespitose to colonial from short-creeping rhizomes; basal sheaths reddish brown pubescent. Culms lateral, 25–80 cm, flexuous, arching, pubescent. Leaves 3 to 5, M-shaped in cross section, soft pubescent, dark green, sheath fronts membranous. Inflorescences 2–8 cm, with 2 to 5 spikes, terminal spikes staminate, lateral spikes pistillate, short-peduncled, ascending; proximal bracts leaf-like, pubescent, sheathless or nearly so, usually shorter than inflorescence. Pistillate scales (at least the proximal ones) awned. Perigynia ascending, ellipsoid-obovoid, trigonous in cross section, nerveless on the faces, with 2 marginal nerves, pubescent, contracted to a bidentulate beak 0.7–1.5 mm long. Stigmas 3.

SPECIES INCLUDED:

1. *Carex hirtifolia* Mackenzie, Bull. Torrey Bot. Club 37: 244. 1910. Replaced name: *Carex pubescens* Willdenow, Sp. Pl. 4(1): 281. 1805, not *C. pubescens* Poiret, Voy. Barbarie 2: 254. 1789.

Carex hirtifolia was placed by Mackenzie (1935: 215) in his inclusive section *Triquetrae*: "a group of dry ground species, represented in North America in the temperate and warmer parts by five species." Included were a diverse assemblage: *Carex hirtifolia*, a species of deciduous forests in the eastern United States and adjacent Canada; *C. triquetra* Boott, a species of the Mediterranean climate zone of California, extending into Baja California; *C. planostachys* Kunze, a calciphile of dry forests, scrub, and desert ranging from southwestern Arkansas, southern Oklahoma, and southeastern New Mexico south to Guatemala; and *C. dasycarpa* Muhlenberg and *C. tenax* Dewey, two species of dry, sandy, open forests of the coastal plain of the southeastern United States.

Carex hirtifolia differs strikingly from all the other species in Mackenzie's section *Triquetrae* in its relatively wide (4–9 mm), thin-textured, soft-pubescent foliage, long-beaked perigynia that are nerveless except for the two main ribs, red-tinged basal sheaths, primarily mesic deciduous forest ecology, and distribution in the northeastern and central United States and adjacent Canada.

The closest relatives of *Carex hirtifolia* are uncertain. The slender, long-beaked perigynia nerveless on the faces are similar to those of some species in section *Hymenochlaenae* (Drejer) L. H. Bailey, although *C. hirtifolia* lacks the elongate and usually pendent spikes typical of species in section *Hymenochlaenae*. *Carex hirtifolia* is known, however, to hybridize with some species in section *Hymenochlaenae*, including *C. gracillima* Schweinitz, forming *C.* ×*sullivantii* Boott (Cayouette & Catling, 1992), and also *C. arctata* Boott (Reznicek, unpublished data).

The remaining species in Mackenzie's section *Triquetrae* still comprise a diverse agglomeration. The Californian and Mexican *Carex triquetra* is quite different from all the remaining species in having relatively elongate, many-flowered spikes 1–

4.5 cm long, densely papillose, coriaceous leaves, and long-sheathing proximal bracts. It is probably best recognized as the only member of the monotypic section *Triquetrae*.

Carex planostachys and the recently described *C. lativena* S. D. Jones & G. D. Jones (Jones & Jones, 1993) from Texas, Arizona, and northern Mexico are extremely similar, and also very similar to the Mediterranean *C. halleriana* Asso and are best placed in section *Hallerianae* (Ascherson & Graebner) Rouy.

Carex tenax and *C. dasycarpa* can be tentatively included in section *Hallerianae* until further study. Like *C. planostachys*, *C. lativena*, and *C. halleriana*, they are dryland species with pubescent, many-nerved, trigonous, short-beaked perigynia in short spikes with sheathless or very short-sheathing bracts. However, they lack the characteristic basal spikes of *C. halleriana* and its allies, and further research may show they are not closely related to the other species in section *Hallerianae*.

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